

WHAT IS CLAIMED IS:

1. A chemical analyzer probe insertable in an opening in a container of process fluid, comprising:

a gland extending from a tubular end insertable in the opening to a second gland end connectable to a chemical analyzer, the gland having a sealing surface sealable to the opening,

a porous tubular filter joined to the tubular end and extending to a closed end in the process fluid to form a filter cavity holding a filter fluid;

a coating deposited on the porous tubular filter, the coating being formed of a chemically selective material that allows a first chemical in the process fluid to flow into the filter fluid, while selectively excluding a second chemical in the process fluid; and

a sensor coupled to the filter fluid for sensing and connectable to a chemical analyzer through the second gland end.

2. The chemical analyzer probe of Claim 1 wherein the chemically selective material comprises a hydrophobic material.

3. The chemical analyzer probe of Claim 1 wherein the chemically selective material comprises a hydrophilic material.

4. The chemical analyzer probe of Claim 3 wherein the hydrophilic material is selected from the group: polyethersulfone, acrylic copolymer, and polysulfone.

5. The chemical analyzer probe of Claim 1 wherein the chemically selective material comprises an ion selective material selected from the group of: polypropylene, polystyrene, Teflon, silicone rubber.

6. The chemical analyzer probe of Claim 1 wherein the porous tubular filter comprises glass frit.

7. The chemical analyzer probe of Claim 1 wherein the porous tubular filter comprises ceramic.

8. The chemical analyzer probe of Claim 1 wherein the porous tubular filter comprises hastalloy.

9. The chemical analyzer probe of Claim 1 wherein the porous tubular filter comprises nickel.

10. The chemical analyzer probe of Claim 1 wherein the porous tubular filter comprises a composite material.

11. The chemical analyzer probe of Claim 1 wherein the porous tubular filter has wall thickness that does not exceed 1 mm.

12. The chemical analyzer probe of Claim 1 wherein the porous tubular filter blocks flow of particles from the process fluid to the filter fluid.

13. The chemical analyzer probe of Claim 1 wherein the sensor comprises a pH sensor.

14. The chemical analyzer probe of Claim 1 wherein the sensor comprises an ISFET sensor.

15. The chemical analyzer probe of Claim 1 wherein the sensor comprises a contacting fluid conductivity sensor.

16. The chemical analyzer probe of Claim 1 wherein the sensor comprises a non contact conductivity sensor.

17. The chemical analyzer probe of Claim 1 wherein the sensor comprises a gas sensor.

18. The chemical analyzer probe of Claim 1 wherein the sensor comprises an ion specific sensor.

19. The chemical analyzer probe of Claim 1 wherein the filter fluid comprises a portion of the process fluid selected by the coating.

20. The chemical analyzer probe of Claim 1 wherein the filter fluid comprises a buffer solution and a portion of the process fluid selected by the coating.

21. The chemical analyzer probe of Claim 1 wherein the second chemical comprises a corrosive chemical selected from the group:  $\text{SO}_3$ ,  $\text{H}_2\text{SO}_4$ ,  $\text{HCl}$ ,  $\text{NH}_3$ .

22. The chemical analyzer probe of Claim 1 wherein the sealing surface has a shape that conforms to 3A sanitary standards.

23. A method of manufacturing a chemical analyzer probe insertable in an opening in a container of process fluid, comprising:

shaping a gland to extend from a tubular end insertable in the opening to a second gland end connectable to a chemical analyzer, and shaping a sealing surface on the gland to seal to the opening;

providing a porous tubular filter extending to a closed end in the process fluid to form a filter cavity holding a filter fluid;

joining the porous tubular filter to the tubular end;

depositing a coating on the porous tubular filter; the coating being formed of a chemically selective material to allow a first chemical in the process fluid to flow into the filter fluid, and to exclude a second chemical in the process fluid; and coupling a sensor to the filter fluid for sensing; the sensor being connectable to a chemical analyzer through the second gland end.